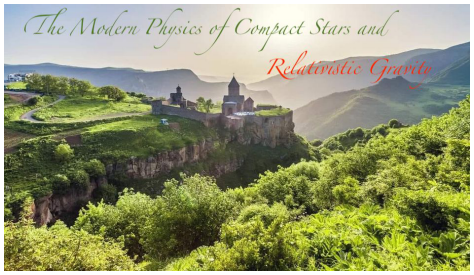

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Neutron stars in f (R, T) gravity using realistic equations of state

Thursday, September 30, 2021 5:25 PM (45 minutes)

In this work we investigate neutron stars (NS) in f (R, T) gravity for the case R + 2λT , R is the Ricci scalar and T the trace of the energy-momentum tensor. The hydrostatic equilibrium equations are solved considering realistic equations of state. The neutron stars masses and radii obtained are subject to a joint constrain from massive pulsars and the event GW170817. The parameter λ needs to be negative as in previous NS studies, however we found a minimum value for it. The pressure in this modified theory of gravity depends on the inverse of the sound velocity v . Since, v is low in the crust, |λ| need to be very small. We found that the increment in the star mass is less than 1%, much smaller than previous ones obtained not considering the realistic stellar structure, and the star radius cannot become larger, and its changes compared to GR is less than 3.6% in all cases. The NS crust effect implying very small values of |λ| does not depend on the theory's function chosen, since for any other one the hydrostatic equilibrium equation would always have the dependence on the inverse of the sound velocity. Finally, we highlight that our results indicate that conclusions obtained from NS studies done in modified theories of gravity without using realistic EsoS that describe correctly the NS interior can be unreliable.

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